

Mercury in Fish from Lake Pillsbury

Information for sport fishers and others who eat fish from Lake Pillsbury

HEALTH ADVISORY FOR LAKE PILLSBURY

Because of elevated levels of mercury in fish, women who are pregnant or may become pregnant within a year, nursing mothers, and children under age six should not eat fish from Lake Pillsbury in Lake County. Other adults and children age six and older may eat fish from Lake Pillsbury on an occasional, but not regular, basis.

How did the advisory for Lake Pillsbury come about?

Mercury was detected at elevated levels in fish from Lake Pillsbury as part of studies conducted by the State Water Resources Control Board. The California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA), which assesses health risks from exposure to hazardous chemicals, is issuing a health advisory to inform the public of the potential health risks from eating fish from Lake Pillsbury. An interim advisory for Lake Pillsbury, developed by the Lake County Environmental Health Division with OEHHA's assistance, was previously issued in June 1999.

Chemical tests have found elevated levels of mercury in largemouth bass and Sacramento pike minnow (also called squawfish) from Lake Pillsbury. Due to limited resources, rainbow trout and other species from Lake Pillsbury (such as blue gill) have not been tested, and thus levels of mercury in those species are not known. Rainbow trout are stocked in Lake Pillsbury, and the younger, smaller trout may not have accumulated high levels of mercury. However, larger trout may contain higher levels of mercury and will be tested in the future. In the interim, as a prudent health measure, people should limit their consumption of all Lake Pillsbury fish in accordance with this advisory.

Where does mercury come from?

Mercury is a metal that occurs naturally in the environment in several forms. It is a common element in the California Coast Range, where it was mined as cinnabar ore largely to support gold mining operations. Mercury enters the environment from the breakdown of minerals in rocks and from old mine tailings. Mercury is also emitted into air from mining deposits, burning of fossil fuels, and other industrial sources. Mercury in the global atmosphere can end up in water bodies through rainfall and runoff from land.

Mercury tends to accumulate in sediments in the bottom of lakes and rivers. Many water bodies in northern California have relatively high levels of mercury in the sediments. Microorganisms such as bacteria that live in the lake bottom can convert mercury to the organic form methylmercury, which is taken up by worms and other small animals living in the sediments. Methylmercury accumulates in fish that eat these animals and in larger fish that eat the smaller fish. In this way, methylmercury accumulates in fish at levels many times greater than levels in the surrounding water. The health concerns are due to methylmercury, which is more toxic than many other forms of mercury and which constitutes almost all of the mercury in fish.

What are the sources of mercury in Lake Pillsbury?

The exact sources of mercury in Lake Pillsbury are not known. The surrounding area is likely to be rich in mercury, and physical and chemical conditions in the lake may be very suitable for mercury that has settled in the bottom to be converted to methylmercury.

Mercury has been detected at relatively high levels in fish but has not been detected in water samples in Lake Pillsbury. This difference is due to the fact that mercury does not concentrate in water as it does in fish. Therefore, the water in the lake is considered safe, and water that flows out of Lake Pillsbury is not known to pose a threat due to mercury for people or aquatic life.

What are the health concerns from eating fish from Lake Pillsbury?

The nature and extent of health effects from exposure to methylmercury in fish will depend on the amount to which a person is exposed.

The nervous system is especially sensitive to methylmercury, particularly in the developing fetus and young children. When a pregnant woman is exposed to methylmercury and some of it is transferred to her developing child, harmful developmental effects can occur. Also, nursing mothers can pass methylmercury to their infants through breast milk. For these reasons, it is particularly important for nursing mothers and women who are pregnant or may become pregnant to carefully follow the guidance provided and not eat fish from the lake.

Long-term exposure to methylmercury at levels found in Lake Pillsbury fish could cause subtle health effects in some individuals that may not be apparent. These subtle effects could include small decreases in performance of activities involving visual memory, fine-motor skills, language, or attention. Symptoms from exposure to much larger amounts of methylmercury have included memory loss, irritability, weakness, insomnia, tremors, and sensory, motor, and cognitive deficits. Developmental effects from exposure to methylmercury at levels much higher than those found in Lake Pillsbury fish include delays in developmental milestones (such as walking and talking) and damage to the brain and nervous system.

Following OEHHA's consumption guidelines will help prevent the buildup of mercury in the body over time, and protect individuals from effects of methylmercury exposure.

What about other sources of mercury?

Eating fish is the principal way that people are exposed to methylmercury. Mercury is the most common reason that states have issued fish consumption warnings.

Another main source of exposure to mercury is from breathing (or swallowing) small amounts of mercury released from the dental amalgam used in fillings. However, the minimal exposure to inorganic mercury from dental fillings is less harmful than exposure to methylmercury. People can also be exposed to mercury from accidental spills, such as from broken thermometers.

How can families reduce the risk of exposure to methylmercury?

By following the recommended consumption guidelines, fishers and families can avoid excessive exposure to methylmercury in fish from Lake Pillsbury, and can reduce the risks of harmful effects. Because fetuses and very young children are more susceptible to the effects from methylmercury, pregnant or nursing women and young children are advised to follow the guidelines carefully and not eat fish from Lake Pillsbury. For other people in the general population, occasional consumption of fish from Lake Pillsbury should not result in excess risk of harmful health effects from exposure to methylmercury. Each person should follow these recommendations, and also consider their other potential sources of exposure to methylmercury from fish.

People who regularly fish at other locations with advisories, such as Clear Lake, should avoid eating the maximum amount recommended for each location. As an example, one might choose to eat half the recommended amount of fish at each of two locations with fish advisories.

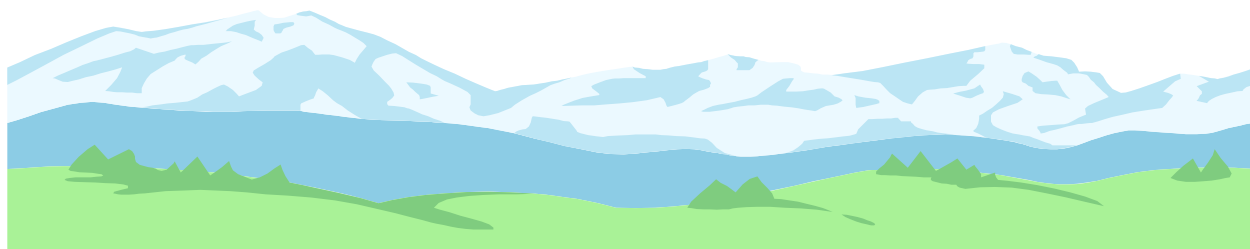
Fish that live upstream and downstream from Lake Pillsbury have not been tested, due to limited resources. People who want to be especially cautious might also limit consumption of largemouth bass from these other locations.

All sources of fish should be considered when making choices about the quantity and types of fish to eat because most fish contain some amount of methylmercury. Most commercial fish have low levels of methylmercury, while greater methylmercury levels are present in top predatory species such as shark and swordfish. The U.S. Food and Drug Administration recommends that pregnant women and women who may become pregnant limit their consumption of shark and swordfish to no more than one meal a month, and that the general population eat no more than one meal a week of these species.

Methylmercury will naturally leave the body over time if you stop your exposure to it. Methylmercury in the body decreases by one half about every two months. This is important for women who plan a pregnancy. They can greatly reduce methylmercury that has accumulated in the body by following the recommended guidance for a year before they become pregnant.

How does mercury in fish from Lake Pillsbury compare with other fish in California?

The levels of mercury found in fish from Lake Pillsbury are among the higher levels documented in fish in California. Although fish in many water bodies in California have not been tested, similar levels of mercury have been found in largemouth bass in other lakes in California and in some fish along the coast, such as sharks.



What is being done to follow up at Lake Pillsbury?

The North Coast Regional Water Quality Control Board plans to test additional fish from Lake Pillsbury, particularly rainbow trout, to verify whether this species should be included in the advisory, and to monitor mercury levels over time.

Due to the natural prevalence of mercury in California, and the deposition of mercury into waterways over a long period of time, it is expected that mercury will continue to persist in the environment for many years. OEHHA has developed fish consumption guidelines and additional information to help individuals reduce their exposure to methylmercury. Members of the general population who choose to eat an occasional meal from Lake Pillsbury should not exceed the meal sizes in the table below.

How to Adjust Fish Meal Size for Body Weight

Fish consumption guidelines are based on the amount of fish people eat at a meal.

IF YOU WEIGH...		YOUR MEAL SIZE SHOULD BE...	
pounds	or kilograms	ounces	or grams
19	9	1	28
39	18	2	57
58	26	3	85
77	35	4	113
96	44	5	142
116	53	6	170
135	61	7	199
154	70	8*	227
173	79	9	255
193	88	10	284
212	96	11	312
231	105	12	340
250	113	13	369
270	123	14	397
289	131	15	425
308	140	16*	454

*8 ounces equals ½ pound and 16 ounces equals one pound

Reminder: Pregnant and nursing women, women who may become pregnant within a year, and children under age six should not eat any fish from Lake Pillsbury.

For more information, contact:

Office of Environmental Health Hazard Assessment (OEHHA)
Pesticide and Environmental Toxicology Section
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Oakland, California 94612

Call (510) 622-3170 or visit the Web site at <http://www.oehha.ca.gov>